

CLAIMS

We claim:

1. A method of securely displaying visual data comprising the steps of:
  - a. encrypting the visual data, whereby encrypted visual data is formed;
  - b. transporting the encrypted visual data to a display apparatus;
  - c. decrypting the encrypted visual data within the display apparatus such that an electronic version of the visual data is maintained within circuit elements that are substantially inaccessible; and
  - d. displaying the visual data as a visual image.
2. The method of claim 1 wherein the circuit elements comprise integrated circuit elements.
3. The method of claim 2 wherein the integrated circuit elements comprise a display circuit and a diffractive light valve, the diffractive light valve displaying the visual image.
4. The method of claim 3 wherein the diffractive light valve comprises a grating light valve.
5. The method of claim 4 wherein the integrated circuit elements comprise portions of a single integrated circuit.
6. The method of claim 4:
  - a. wherein the integrated circuit elements comprise individual integrated circuits; and
  - b. further comprising the steps of encoding and decoding the visual data in order to transfer the visual data between the individual integrated circuits.

- 1           7.           The method of claim 4 wherein the display circuit comprises a driver  
2           circuit for driving the grating light valve.
- 1           8.           The method of claim 4 wherein the step of displaying the visual data  
2           comprises scanning a line image over a display screen such that the visual image  
3           has low persistence.
- 1           9.           The method of claim 4 wherein the integrated circuit elements comprise a  
2           decryption circuit.
- 1           10.          The method of claim 4 wherein the step of transporting the encrypted  
2           visual data comprises electronic transmission.
- 1           11.          The method of claim 10 wherein the electronic transmission is selected  
2           from the group consisting of satellite transmission, optical fiber transmission, and  
3           internet transmission.
- 1           12.          The method of claim 4 wherein the step of transporting the encrypted  
2           visual data comprises recording the encrypted visual data on a storage media and  
3           physically transporting the storage media.
- 1           13.          The method of claim 12 wherein the storage media comprises a standard  
2           storage media.
- 1           14.          The method of claim 12 wherein the storage media comprises a non-  
2           standard storage media.
- 1           15.          The method of claim 1:  
2           a.           wherein the step of encrypting the visual data comprises uses a  
3           public key; and  
4           b.           further comprising the step of generating the public key and a  
5           private key, the private key residing within the display apparatus.

1           16.           The method of claim 15 wherein the step of generating the public key and  
2                      the private key takes place within the display apparatus.

1           17.           The method of claim 15  
2                      a.           wherein the step of generating the public key and the private key  
3                              takes place outside of the display apparatus; and  
4                      b.           further comprising the step of inputting the private key to the  
5                              display apparatus in such a manner that human access to the private key is  
6                              substantially unavailable.

1           18.           The method of claim 1 wherein the step of encrypting the visual data  
2                      includes using a secret key and further wherein the step of decrypting the  
3                      encrypted visual data includes using the secret key.

1           19.           A system for securely transmitting and displaying visual data comprising:  
2                      a.           an encryption apparatus for encrypting the visual data, whereby  
3                              encrypted visual data is formed;  
4                      b.           means for transporting the encrypted visual data from the  
5                              encryption apparatus to a display facility; and  
6                      c.           a display apparatus located at the display facility that receives the  
7                              encrypted visual data, the display apparatus decrypting the encrypted  
8                              visual data such that an electronic version of the visual data is maintained  
9                              within circuit elements that are substantially inaccessible, the display  
10                             apparatus displaying the visual data as a visual image.

1           20.           The system of claim 19 wherein the circuit elements comprise integrated  
2                      circuit elements.

1           21.           The system of claim 20 wherein the integrated circuit elements comprise a  
2                      display circuit and further wherein the display circuit comprises a diffractive light  
3                      valve for displaying the visual image.

1           22.           The system of claim 21 wherein the light valve comprises a grating light  
2                    valve.

1           23.           The system of claim 22 wherein the integrated circuit elements comprise  
2                    portions of a single integrated circuit.

1           24.           The system of claim 22 wherein the integrated circuit elements comprise  
2                    individual integrated circuits and further wherein the integrated circuit elements  
3                    encode and decode the visual data to transfer the visual data between the  
4                    individual integrated circuits.

1           25.           The system of claim 22 wherein the display apparatus includes a scanning  
2                    device for scanning a linear image over a display screen such that the visual image  
3                    has low persistence.

1           26.           The system of claim 22 wherein the means for transporting the encrypted  
2                    visual data includes means for electronic transmission.

1           27.           The system of claim 26 wherein the means for electronic transmission is  
2                    selected from the group consisting of satellite transmission, optical fiber  
3                    transmission, and internet transmission.

1           28.           The system of claim 22 wherein the means for transporting the encrypted  
2                    visual data includes a storage media, the storage media holding the encrypted  
3                    visual data during transport of the storage media.

1           29.           The system of claim 28 wherein the storage media comprises a standard  
2                    storage media.

1           30.           The system of claim 28 wherein the storage media comprises a non-  
2                    standard storage media.

- 1           31.           The system of claim 19 wherein the encryption apparatus uses a public key  
2                   for encrypting the visual data and further wherein the display apparatus uses a  
3                   private key for decrypting the visual data, the private key residing within the  
4                   display apparatus.
- 1           32.           The system of claim 31 wherein the display apparatus generates the public  
2                   key and the private key.
- 1           33.           The system of claim 31 wherein the public key and the private key have  
2                   been generated outside of the display apparatus and further wherein the private  
3                   key has been generated and input to the display apparatus in such a manner that  
4                   human access to the private key is substantially unavailable.
- 1           34.           The system of claim 19 wherein the encryption apparatus uses a secret key  
2                   for encrypting the visual data and further wherein the display apparatus uses the  
3                   secret key for decrypting the visual data.
- 1           35.           A display apparatus for displaying encrypted visual data comprising circuit  
2                   elements that are substantially inaccessible, the circuit elements comprising a  
3                   decryption circuit for decrypting the encrypted visual data, whereby visual data is  
4                   formed, the circuit elements comprising a display circuit for displaying the visual  
5                   data as a visual image, such that an electronic version of the visual data is  
6                   maintained within the circuit elements.
- 1           36.           The display apparatus of claim 35 wherein the display circuit comprises a  
2                   diffractive light valve for displaying the visual image.
- 1           37.           The display apparatus of claim 36 wherein the diffractive light valve is a  
2                   grating light valve.
- 1           38.           A display apparatus for displaying encrypted visual data comprising:

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- 2                   a.               a decryption circuit for decrypting the encrypted visual data,
- 3                               whereby visual data is formed; and
- 4                   b.               a grating light valve for displaying the visual data as a visual
- 5                               image.

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